

**9.4.3 Case Study, The Visitor Center at Zion National Park, Utah
(Public Assembly/Retail/Office)****Building Design**

Visitors Center (1)	8,800 SF	Comfort Station (2)	2,756 SF	Fee Station	170 SF
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Shell**Windows**

	<u>Type</u>	<u>U-Factor</u>	<u>SHGC (3)</u>
South/East Glass	Double Pane Insulating Glass, Low-e, Aluminum Frames, Thermally Broken	0.44	0.44
North/West Glass	Double Pane Insulating Glass, Heat Mirror, Aluminum Frames, Thermally Broken	0.37	0.37

Window/Wall Ratio: 28%

Wall/Roof

	<u>Materials</u>	<u>Effective R-Value</u>
Trombe Walls:	Low-iron Patterned Trombe Wall, CMU (4)	2.3
Visitor Center Walls:	Wood Siding, Rigid Insulation Board, Gypsum	16.5
Comfort Station Walls:	Wood Siding, Rigid Insulation Board, CMU (4)	6.6

Roof:	Wood Shingles; Sheathing; Insulated Roof Panels	30.9
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HVAC**Heating**

Trombe Walls
Electric Radiant Ceiling Panels

Cooling

Operable Windows
3 Cooling Towers

Lighting Power Densities(W/SF)

Main Area:	(5)
Offices:	1.0
Bookstore:	0.9

Energy/Power:

PV System:	7.2 kW grid-tie system
Net Annual Energy Usage (thousand Btu/SF*year):	27.0

Note(s): 1) Includes office, bookstore, and service areas 2) restroom complex 3) Solar heat gain coefficient 4) Concrete masonry unit 5) The main visitors center area is handled almost entirely with daylighting. Auxiliary fluorescent lighting is used only occasionally to supplement.

Source(s): NREL, Evaluation of the Low-Energy Design and Energy Performance of the Zion National Park Visitors Center, Feb. 2005, p. 23-37;
NREL, Lessons Learned from Case Studies of Six High-Performance Buildings, June 2006, p. 5 Table A-2 p. 130.